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(IN COOPERATION WITH THE DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF THE CENSUS, S. N. D. NORTH, DIRECTOR.)

PRODUCTION OF TIGHT COOPERAGE
STOCK IN 1906.

Previous to 1905, statistics upon the production of lumber and timber products were collected by the Bureau of the Census in connection with the decennial and quinquennial censuses of manufactures. To satisfy an urgent demand for more frequent reports upon these important products the Forest Service collected statistics of the production in 1905. In 1906 the Bureau of the Census and the Forest Service arranged to cooperate in the preparation of annual statistics of forest products.

The collection and compilation of the statistics of production in 1906, therefore, have been under the direct supervision of W. M. Steuart, Chief Statistician for Manufactures, and J. E. Welchel, Expert Chief of Division, on the part of the Bureau of the Census; and R. S. Kellogg, Chief of the Office of Wood Utilization, and H. M. Hale, Forest Assistant, on the part of the Forest Service.

[Cir. 125]

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PRODUCTION OF TIGHT COOPERAGE STOCK IN 1906.

The chief features in the production of tight cooperage stock for the year 1906 were, first, an increase of more than 25,000,000 staves over the production of 1905; second, an increase of more than 5,000,000 sets of heading over the production of 1905; third, an advance in price of all stock, but particularly in the higher grades; and, fourth, a scarcity of heading early in the season, and of staves, particularly oil staves, later in the year.

PRODUCTION.

The increased production, coupled with a strong market throughout the year, indicates clearly that the amount of stock produced was not sufficient to meet all demands. The Pure Food Law strengthened the market for alcoholic packages. Immediately after this law went into effect there was a sharp demand upon distillers for a considerable quantity of bonded goods. To supply this deficiency the distillers were forced to increase their production, and made consequent demand for a large number of barrels. This action alone would have strengthened the market for oil barrels, and, in addition, there was the enormous production of petroleum oil for 1905, greater by over 17,000,000 barrels than for any previous year, and a large production of cotton-seed oil, and many other commodities marketed in tight packages. More than this, the market for white oak lumber had never been so strong in the history of the industry, and since the stave manufacturer must compete directly with the manufacturer of white oak lumber, this fact alone would have been sufficient to cause the price to advance considerably. Altogether, the industry had a very successful year; there was no difficulty in disposing of the stock produced, though there was some in finding a sufficient supply of white oak. A clear indication of this latter condition is found in the increased production of red oak staves. In 1905 the number produced was about 7,000,000, while in 1906 it exceeded 11,000,000.

STAVES.

Table 1 shows that the total production of all kinds of tight staves in 1905 was 241,193,000; in 1906 it reached 267,827,000. The heading production in 1905 aggregated 12,959,000 sets; in 1906 it was 17,774,375 sets. The average price obtained for heading was 23 cents per set, and for staves \$31.32 per thousand f. o. b. point of shipment, which in most cases was the point of manufacture.

TABLE 1.—Quantity of tight barrel staves and heading produced in 1906 and 1905.

STAVES.

Kind.	1906.			1905.
	Number.	Value.	Average price per thousand f. o. b. point of manufacture.	
	<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Thousands.</i>
Sawed.....	219,524	5,746,780	26.18	202,369
Bucked and split.....	18,352	866,821	47.23	10,792
Hewed.....	9,781	915,740	93.62	10,396
Ale and beer.....	20,170	860,301	42.65	17,636
Total.....	267,827	8,389,642	31.32	241,193

HEADING.

	<i>Sets.</i>	<i>Dollars.</i>	<i>Dollars per set</i>	<i>Sets.</i>
Sawed.....	16,115,030	3,612,281	0.22	11,023,000
Beer.....	1,659,345	387,349	.23	1,936,000
Total.....	17,774,375	3,999,630	.23	12,959,000

There was an increase in the production of all kinds of staves except pork staves; this class shows an unimportant decrease. The amount of heading produced shows a much larger proportionate increase than the number of staves, but in view of the shortage in the heading market last year it may be that this increase is only sufficient to take care of the shortage which occurred at that time.

The total value in Table 1 is less than that given in the figures for 1905,^a because the value in 1905 represents values "delivered" at Chicago quotations. The value in Table 1 is f. o. b. at point of shipment, and therefore not comparable with the value given in the 1905 circular.

PRICES.

In order to gain a fair comparison of the relative prices obtained for the principal grades of cooperage stock for 1905 and 1906, the following quotations from the Chicago market are given. In 1905 the approximate average price for bucked Bourbon staves was \$65 per 1,000; in 1906, figuring at the same period of the year, the average price was \$70 per 1,000. Sawed Bourbon staves in 1905 show an average price of \$50; in 1906, \$56 per 1,000. Spirits and wine advanced from \$50 to \$52.50; oil and tierce from \$32 to \$35. The quotations on beer stock showed little variation between the two years. In the heading market there was little difference in the price of Bourbon heading, and seven-eighth inch stock was quoted at \$0.50 per set, both in 1905 and 1906. Spirits and wine, however, advanced from 35 cents in 1905 to 42 cents in 1906, while oil and

^a Circular 53, Forest Service: Wood Used for Tight Cooperage Stock in 1905.

tierce advanced from 20 cents in 1905 to 28 cents per set in 1906. It is believed that the quotations of the Chicago market, as compiled by the Tight Barrel Stave Manufacturers' Association and furnished throughout the year, are substantially correct and indicate the change in prices which has taken place during the season.

EXPORTS.

On an average more than one-fifth of the tight stave production in the United States is exported, as is shown by Table 2, which gives the exports of staves for the fiscal years 1902-1906, as compiled by the Bureau of Statistics of the Department of Commerce and Labor. About four-fifths of all the staves exported go to Europe, and most of the remaining fifth to other countries of North America. The quantity going to South America, Africa, Asia, and Oceania is negligible. Of the European countries, France is by far the largest user of American staves.

TABLE 2.—Quantity and value of staves exported, 1902-1906.

Year.	Quantity.	Value.	Average price per thousand.
	<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>
1902.....	46,999	3,830,432	81.50
1903.....	55,879	4,740,680	84.84
1904.....	47,420	4,032,344	85.03
1905.....	48,286	3,613,635	74.84
1906.....	57,586	4,699,877	81.61

Nearly all of the exported staves are of high quality and require white oak of the best grade. Thus the export trade makes a disproportionately heavy drain on the supply of white oak—a drain much greater than is indicated by comparison of the number manufactured with the number exported. When it is considered that all staves of all kinds are valued at \$8,389,642 at the point of production, and the quantity exported (though only one-fifth in number) is valued at \$4,699,877 at the point of exportation, a better idea is obtained of this drain on the best white oak supply.

The fall in the average price in 1905 for export material can be explained only by the lessened foreign demand, due to some unknown factor of spirit production abroad. It can not be attributed to overproduction or to an abundant wood supply in this country.

Table 3 shows the production of tight barrel staves in 1905 and 1906 by States and classes. By far the greater part of this stock is produced in comparatively few States. In 1906 the leading ones in order of their importance were Arkansas, Kentucky, Tennessee, West Virginia, Louisiana, and Alabama. In 1905, however, Kentucky led, followed by Tennessee, Missouri, Arkansas, Louisiana,

Ohio, and West Virginia. West Virginia has very recently become important in the production of staves. It has a wealth of white oak timber, but up to the present time most of it has been very inaccessible. Since 1905, however, the total production from West Virginia has increased from about 11,000,000 to more than 30,000,000 staves.

TABLE 3.—*Production of tight barrel staves in 1905 and 1906, by States.*

State.	Total.			Sawed.		
	1906.			1905.	1906.	1905.
	Number.	Value.	Average price per M (f. o. b. at mill).			
	<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>
Alabama.....	14,424	451,447	31.30	5,955	13,976	5,893
Arkansas.....	67,551	2,051,425	30.37	23,939	62,835	21,192
Georgia.....	1,530	33,250	21.73	.....	1,530	.....
Illinois.....	1,700	74,100	43.59	8,459	.....	7,756
Indiana.....	766	17,220	22.48	8,800	766	7,500
Kentucky.....	61,123	2,236,271	36.59	61,270	40,666	46,980
Louisiana.....	14,784	884,092	59.80	15,095	7,088	4,506
Michigan.....	.....	.....	.....	1,325	.....	1,325
Mississippi.....	11,671	429,832	36.83	6,798	8,273	4,381
Missouri.....	11,724	232,067	19.79	26,993	11,464	24,871
New York.....	.....	.....	.....	1,191	.....	1,050
Ohio.....	1,105	70,075	63.42	12,712	555	12,712
Pennsylvania.....	612	15,008	24.52	2,704	612	2,561
Tennessee.....	32,865	808,828	24.61	37,468	29,918	35,093
Texas.....	2,900	177,309	61.14	3,451	3	2,968
Virginia.....	5,542	141,150	25.47	2,045	5,205	1,495
West Virginia.....	30,740	595,728	19.38	11,353	29,700	11,353
All others.....	8,790	171,840	19.55	11,635	6,933	10,733
Total.....	267,827	8,389,642	31.32	241,193	219,524	202,369

State.	Bucked and split.		Hewed.		Beer and ale.	
	1906.	1905.	1906.	1905.	1906.	1905.
	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>
Alabama.....	448	59	.....	3	.....	.....
Arkansas.....	3,993	1,930	275	.....	448	817
Georgia.....	.....	.....	.....	3	1,700	700
Illinois.....	.....	1,300	.....	.....	.....	.....
Indiana.....	.....	2,137	45	43	14,005	12,110
Kentucky.....	6,407	2,800	6,629	7,384	.....	405
Louisiana.....	1,067	.....	.....	.....	.....	.....
Michigan.....	2,203	1,119	1,195	1,298	.....	.....
Mississippi.....	.....	590	.....	.....	200	1,532
Missouri.....	.....	40	.....	70	.....	31
New York.....	.....	.....	550	.....	.....	.....
Ohio.....	.....	.....	.....	.....	.....	.....
Pennsylvania.....	.....	.....	.....	.....	.....	143
Tennessee.....	550	.....	700	1,575	1,697	800
Texas.....	2,547	230	147	20	203	233
Virginia.....	277	500	60	.....	.....	50
West Virginia.....	860	.....	180	.....	.....	.....
All others.....	.....	87	.....	.....	1,857	815
Total.....	18,352	10,792	9,781	10,396	20,170	17,636

SAWED STAVES.

In the production of sawed staves, which are by far the most important class numerically, Arkansas leads, followed by Kentucky, Tennessee, and West Virginia. In 1905 Kentucky was in the lead, followed by Tennessee, Missouri, and Arkansas.

TABLE 4.—Production of sawed staves in 1905 and 1906.

Grade.	Timber.	1906.			1905.
		Number.	Value (f. o. b. at mill).	Price per thousand.	
		<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Thousands.</i>
Oil and tierce.....	White oak.....	107,295	2,484,168	23.15	104,067
Oil and tierce.....	Red oak.....	11,578	231,655	20.01	7,737
Spirit and wine.....	White oak.....	29,857	1,210,362	40.54	28,094
Bourbon.....	White oak.....	22,737	1,117,570	49.15	20,460
Pork.....	White oak.....	8,360	160,422	19.19	6,869
Half barrel.....	White oak.....	6,687	131,590	19.68	3,821
Cut-offs.....	Red and white oak.....	18,831	166,842	8.86	16,770
All others.....	Miscellaneous.....	14,179	244,171	17.22	14,551
Total.....		219,524	5,746,780	26.18	202,369

Table 4 compares the production of sawed staves in 1906 and 1905 by classes and kinds of wood. It is interesting to note that, with the exception of red oak oil and tierce, the proportion of the various grades has not changed greatly. In 1905 the white oak oil and tierce staves amounted to a trifle more than half of the total number of sawed staves; adding the red-oak staves, the oil and tierce production was 55 per cent. In 1906 white oak oil and tierce staves were a little less than one-half the sawed staves; the added red oak staves make the proportion of oil and tierce staves about the same as in 1905. The alcoholic staves still constitute a little less than one-fourth of the total number manufactured. The "All other" classification, which includes gum, poplar, elm, pine, and various other woods, shows an unimportant decrease.

TABLE 5.—Production of sawed staves, by classes and States, 1906.

State.	Total.	Oil and tierce.	Spirit and wine.	Bourbon.	Pork.	Half barrel.	Cut-offs.	All others.
	<i>Thou- sands.</i>	<i>Thou- sands.</i>	<i>Thou- sands.</i>	<i>Thou- sands.</i>	<i>Thou- sands.</i>	<i>Thou- sands.</i>	<i>Thou- sands.</i>	<i>Thou- sands.</i>
Alabama.....	13,976	7,863	1,350	1,333	156	428	1,865	981
Arkansas.....	62,835	31,573	17,058	2,703	1,771	507	8,504	719
Georgia.....	1,530	1,530						
Indiana.....	766	50	69	161		36		450
Kentucky.....	40,666	20,240	2,992	14,706	130	194	2,354	50
Louisiana.....	7,088	3,683	2,096	60	49		356	844
Mississippi.....	8,273	5,062	2,112	739	20	114	226	
Missouri.....	11,464	2,900			1,522	2,601	329	4,112
Ohio.....	555	150			405			
Pennsylvania.....	612			300			112	200
Tennessee.....	29,918	16,872	3,700	1,855	2,167	2,427	2,747	150
Texas.....	3	3						
Virginia.....	5,205	3,925	180	100	680		320	
West Virginia.....	29,700	24,722	300	780	1,420	380	2,018	80
All others.....	6,933	300			40			6,593
Total.....	219,524	118,873	29,857	22,737	8,360	6,687	18,831	14,179

The rank of the States in the production of sawed staves is about the same as in total production, except that Louisiana, which produces many hewed staves, stands relatively lower than in the total production.

BUCKED AND SPLIT STAVES.

Table 6 shows the production of bucked and split staves by classes for 1905 and 1906, and Table 7 that by States for 1906. The production of this grade of staves shows an increase from 10,792,000 to 18,352,000. This class of stock is produced exclusively for the storage and transportation of alcoholic liquors, and the most of it is exported. Nearly one-half of the total production is Bourbon, followed by West Indian spirit and wine.

TABLE 6.—*Production of bucked and split staves, 1905 and 1906.*

Grade.	1906.			1905.
	Number.	Value.	Price per thousand.	
	<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Thousands.</i>
Bourbon.....	8,979	477,568	53.19	5,020
West Indian.....	4,136	177,055	42.81	1,966
Spirit and wine.....	2,942	137,301	46.67	1,882
Seconds.....	1,799	61,132	33.98	1,538
Half barrel.....	357	11,715	32.82	291
Cut-offs.....	139	2,050	14.75	95
Total.....	18,352	866,821	47.23	10,792

The average value per 1,000 of Bourbon bucked and split staves is very much higher than for the same class of sawed staves. This is due to the fact that this stock is made entirely by hand by a slow, expensive process, and, further, an unusually high grade of white oak is required, and it is impossible to get from the same amount of wood as many split staves as sawed staves.

TABLE 7.—*Production of bucked and split staves, by States, 1906.*

State.	Total.	Bourbon.	West Indian.	Spirit and wine.	Seconds.	Half barrels.	Cut-offs.
	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>
Alabama.....	448	264	4	40	140	.....	.....
Arkansas.....	3,993	2,123	.....	1,620	131	117	2
Kentucky.....	6,407	2,499	2,785	30	991	65	37
Louisiana.....	1,067	828	31	175	10	.....	23
Mississippi.....	2,203	1,155	424	352	262	.....	10
Tennessee.....	530	250	100	100	100	.....	.....
Texas.....	2,547	1,700	.....	500	165	175	7
Virginia.....	277	60	92	125	.....	.....	.....
West Virginia.....	860	100	700	.....	.....	.....	60
Total.....	18,352	8,979	4,136	2,942	1,799	357	139

HEWED STAVES.

Table 8 shows the production of hewed staves by classes, and Table 9 that by States, in 1906. The two principal items in this classification are French claret and pipe staves. The average price per thousand is misleading, because there are so many different sizes in this class of hewed stock and the ratio of increase in price is dis-

proportionately greater than the increase in size. The \$75 per thousand for French claret and \$121 for pipe staves are at best very general averages and can not be taken as prices for any particular size of stock. In the "All other" items are included a miscellaneous classification, such as tank staves and Canada butts. Louisiana produces about two-thirds of all the hewed staves.

TABLE 8.—*Production of hewed staves.*

Grade.	1906.			1905.
	Number.	Value.	Price per thousand.	
	<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Thousands.</i>
French claret.....	7,442	560,500	75.32	10,193
Pipe.....	1,363	165,040	121.09	95
All others.....	976	190,200	194.88	108
Total.....	9,781	915,740	93.62	10,396

TABLE 9.—*Production of hewed staves by States, 1906.*

State.	Total.	French claret.	Pipe.	All others.
	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>	<i>Thousands.</i>
Arkansas.....	275	243	.....	32
Kentucky.....	45	.....	37	8
Louisiana.....	6,629	5,641	769	219
Mississippi.....	1,195	896	272	27
Ohio.....	550	.....	.....	550
Tennessee.....	700	600	.....	100
Texas.....	147	62	85	.....
Virginia.....	60	.....	60	.....
West Virginia.....	180	.....	140	40
Total.....	9,781	7,442	1,363	976

HEADING.

Table 10 shows the production of tight barrel heading by States, giving in detail the quantities of different kinds. Beer heading and staves are tabulated separately, because the difference in the form of this stock, such as barrel, half barrel, quarter barrel, etc., makes it impossible to classify it with the sawed heading and staves shown elsewhere. In the production of heading Arkansas leads, followed by Tennessee. The combined production of these two States amounts to about two-thirds of the total production in the United States. The only other States that produced any considerable quantity of heading are Mississippi, West Virginia, and Kentucky. The best grade of Bourbon heading is produced in largest quantity in Kentucky, followed by Mississippi and Tennessee. Mississippi's second place indicates in a measure at least that there is slight foundation for the popular idea that oak from the most southern States is of a poorer quality than that grown farther north. In the production of beer heading, Kentucky leads, as it does in the production of beer staves.

TABLE 10.—*Production of tight barrel heading, by classes and States, 1906.*

[Figures show actual number of sets.]

SETS OF SAWED HEADING.

State.	Total.	Oil and tierce.	Bourbon.	Spirit and wine.	Half barrel and keg.	Miscellaneous.
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
Alabama.....	15,000	10,000	3,000	2,000		
Arkansas.....	5,699,484	3,343,750	210,349	926,415	261,760	957,210
Georgia.....	90,121	55,000				35,121
Indiana.....	220,000	100,000			80,000	40,000
Kentucky.....	1,218,394	365,000	600,321	175,901	41,430	35,742
Louisiana.....	47,300					47,300
Maine.....	110,000					110,000
Mississippi.....	1,701,335	645,193	576,573	349,945	90,305	39,319
Missouri.....	430,382	300,000		10,000	120,382	
Ohio.....	30,150	10,100	50			20,000
Tennessee.....	5,011,773	2,672,465	511,387	528,561	993,473	305,887
Texas.....	12,000	12,000				
West Virginia.....	1,425,914	628,514	366,500	12,000	301,900	117,000
Wisconsin.....						
All others ^a	103,177					103,177
Total.....	16,115,030	8,142,022	2,268,180	2,004,822	1,889,250	1,810,756

SETS OF BEER HEADING.

State.	Total.	Barrel.	Half barrel.	Fourth barrel.	Eighth barrel.	Ale hogs-head.	Ale barrel.	Ale half barrel.
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>No.</i>	<i>Number.</i>	<i>No.</i>
Alabama.....								
Arkansas.....	165,316	18,326	115,221	17,828	13,631	310		
Georgia.....								
Indiana.....								
Kentucky.....	1,308,287	49,084	290,978	627,819	275,100	4,385	3,754	57,167
Louisiana.....	38,092	38,092						
Maine.....	3,750	3,750						
Mississippi.....								
Missouri.....	3,700	2,000	400	1,000	300			
Ohio.....								
Tennessee.....	10,000	5,000	5,000					
Texas.....	88,200		55,000				33,200	
West Virginia.....								
Wisconsin.....	42,000	6,000	20,000	16,000				
All others ^a								
Total.....	1,659,345	122,252	486,599	662,647	289,031	4,695	36,954	57,167

^a Includes California, Florida, Massachusetts, Oregon, and Washington.

Table 11 classifies sawed heading produced in 1906 and shows the average value per thousand of each class. The white oak oil and tierce ranks first, followed by Bourbon, spirit and wine, and all others.

TABLE 11.—*Quantity of sawed heading produced in 1905 and 1906.*

Grade.	1906.			1905.
	Quantity.	Value.	Average price per set.	
Oil and tierce.....	<i>No. of sets.</i> 8,142,022	<i>Dollars.</i> 1,443,342	<i>Dollars.</i> 0.18	<i>No. of sets.</i> 5,707,000
Bourbon.....	2,268,180	941,021	.41	1,897,000
Spirit and wine.....	2,004,822	690,255	.34	1,581,000
Half barrel and keg.....	1,889,250	264,755	.14	1,152,000
Pork.....				208,000
All others ^a	1,810,756	272,908	.15	478,000
Total.....	16,115,030	3,612,281	.22	11,023,000

^a Includes 879,908 sets of red oak.

BEER AND ALE STOCK.

STAVES.

Table 12 shows by States and classes the production of beer and ale staves in 1906. This branch of the industry is very much localized and confined closely to the single State of Kentucky. The industry itself is in the hands of a comparatively few men, who, by virtue of their experience, are able most satisfactorily to supply the needs of the users. Considerable skill is required to produce this stock because, since there is no saw which will produce a satisfactory stave, it is necessary to split the stock instead.

TABLE 12.—*Beer and ale staves produced in 1906, by States.*

State.	Total.	Barrel.	Half barrel.	Quarter barrel.	Eighth barrel.	Ale barrel.	Ale half barrel.	Ale and beer hogshead.
	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>	<i>Thou-</i> <i>sands.</i>
Arkansas.....	448	147	207	54	27	.....	.....	13
Illinois.....	1,700	.....	650	900	150	.....	.....	.....
Kentucky.....	14,005	830	4,398	5,635	2,579	224	247	92
Missouri.....	260	5	62	125	68	.....	.....	.....
Tennessee.....	1,697	10	450	850	387	.....	.....	.....
Texas.....	203	67	98	.....	.....	.....	.....	38
All others.....	1,857	149	359	1,227	79	24	.....	19
Total.....	20,170	1,208	6,224	8,791	3,290	248	247	162

BEER AND ALE HEADING.

Table 13 shows the production of beer and ale heading for 1905 and 1906.

TABLE 13.—*Quantity of beer and ale heading produced in 1905 and 1906.*

Grade.	1906.			1905.
	Quantity.	Value.	Average price per set.	
	<i>No. of sets.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>No. of sets.</i>
Barrel.....	122,252	43,288	0.35	307,000
Half barrel.....	486,599	141,127	.29	543,000
Quarter barrel.....	662,647	88,809	.13	740,000
Eighth barrel.....	289,031	35,877	.12	346,000
Ale hogshead.....	4,695	5,276	1.12	.....
Ale barrel.....	36,954	50,038	1.35	.....
Ale half barrel.....	57,167	22,934	.40	.....
Total.....	1,659,345	387,349	.23	1,936,000

Table 14 compares the figures of 1906 and 1905 in the production of beer and ale staves by classes; numerically the quarter-barrel size leads.

TABLE 14.—Production of beer and ale staves, by classes, in 1906.

Grade.	1906.			1905.
	Number.	Value.	Price per thousand.	
	<i>Thousands.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Thousands.</i>
Barrel.....	1,208	97,750	80.92	1,178
Half barrel.....	6,224	300,108	48.22	6,123
Quarter barrel.....	8,791	320,931	36.51	7,380
Eighth barrel.....	3,290	84,932	25.82	2,333
Ale barrel.....	248	22,920	92.42	96
Ale half barrel.....	247	15,850	64.17	50
Ale and beer hogshead.....	162	17,810	109.94	476
Total.....	20,170	860,301	42.65	17,636

SUBSTITUTES.

While the production of wooden stock has increased it has not increased in proportion to the amount of the product. In the oil industry tank cars have tended to displace barrels.

A large number of bottles are used for transporting and storing beer and ale, but no satisfactory substitute has been discovered for the wooden package. Further, for containers of such material as alcoholic spirits, wines, and whiskies, nothing has proved as satisfactory as a wooden package manufactured from white oak. The great demand on the white oak resources of the country for furniture wood and interior finishing wood, and the removal of the most accessible timber, have greatly increased the price of white oak for all purposes, and the result has been a sharp advance in the price of staves and heading, even within the last year.

In many cases a strong effort is being made to replace white oak with other wood. The situation is, perhaps, most serious on the Pacific coast. Wine growers must have suitable packages for storing and shipping their product, and thus far no substitute has been generally recognized as serving the purpose as well as white oak, yet its scarcity and high price, even in the eastern market, make it almost prohibitive to ship it across the continent. Experiments are now being made to devise a package to replace that of white oak for the storage and transportation of wine. Redwood and cypress are being advanced with some show of success. For transportation these woods are almost too soft, especially the redwood. The success of this project, however, will doubtless be watched with considerable interest by the manufacturers of tight-cooperage stock in the East.

Approved:

JAMES WILSON,

Secretary of Agriculture.

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